*1999 Annual Report*

# Pesticide Incident Reporting and Tracking (PIRT) Review Panel

November 2000


Environmental Health Programs

*1999 Annual Report*

# Pesticide Incident Reporting and Tracking Review Panel

A report to the legislature as required by
Chapter 380, Laws of 1989, and RCW 70.104

November 2000


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## EXECUTIVE SUMMARY

The 1999 report is the Pesticide Incident Reporting and Tracking (PIRT) Review Panel's tenth annual report. The PIRT Review Panel consists of the Washington State Departments of Agriculture (WSDA), Ecology, Health (DOH), Labor and Industries (L&I), Natural Resources (DNR), Fish and Wildlife (WDFW), as well as the University of Washington (UW), Washington State University (WSU), Washington Poison Center (WPC), a practicing toxicologist, and a member of the public.

The PIRT Panel is directed by statute (RCW 70:104.090) and has among its responsibilities the identification of inadequacies in pesticide regulations that result in insufficient protection of public health and the approval of an annual report summarizing pesticide incidents. This PIRT report presents and evaluates pesticide incidents reported in 1998 from five state agencies: Agriculture, Ecology, Fish and Wildlife, Health, and Labor and Industries, and the Washington Poison Center. It also describes PIRT 1999 panel activities. This is the complete report to the legislative summary published by DOH in February 2000.

## ACTIONS ON 1998 RECOMMENDATIONS OF THE PIRT PANEL

In 1999, the PIRT Panel addressed recommendations made in the 1998 PIRT Annual Report. These activities are outlined below. Note that some items carried over into the following year because of the complexity of the issue addressed and are therefore listed in the section of the 2000 recommendations.

- *Recommendation*: Further develop the PIRT Panel goals and tasks.
  **Action**: The panel refined the Mission Statement and updated goals and tasks:

  Mission Statement:

  > The mission of the PIRT Panel is to monitor the activities of the state agencies responsible for pesticide regulation, to ensure timely response and adequate monitoring of pesticide use, protection of workers, the public and the environment from the effects of pesticide use and misuse.

  Goals:

  1. To reduce the risk from pesticide exposure to human health and the environment.
  2. To reduce the overall incidence and severity of human pesticide exposures through timely incident investigation, education, and development of public health protection strategies for workers, and the public.
  3. To ensure that appropriate legislation, rules, and guidelines are in place to provide adequate public health and environmental protection from pesticide use and misuse.
  4. To ensure adequate reporting of health related or environmental incidents involving pesticides.
  5. To provide the Governor, agency heads, the legislature, and the public with an annual report of PIRT activities and summary of agency pesticide incident investigations.

Tasks:

1. To review pesticide incidents of unusual complexity or those that cannot be resolved, as requested by the chair or any panel member.
2. To monitor the time periods required for response to reports of pesticide complaints or incidents as recorded by the Departments of Agriculture, Ecology, Health, and Labor and Industries.
3. To establish guidelines for centralizing the receipt of information relating to actual or alleged health and environmental incidents involving pesticides.
4. To review agency procedures for investigation of pesticide incidents and make recommendations for implementation by the appropriate agency.
5. To review and approve an annual report prepared by the Department of Health.

- Recommendation: Prepare a five year (1993 through 1997) analysis of PIRT incident data.
  **Action:** The panel identified issues to be explored from the incident data submitted to PIRT by WSDA, DOH and L&I. The analysis will be carried over as a recommendation for 2000 and will be designed to identify trends for intervention strategies by the agencies.

- Recommendation: L&I conduct a database search for additional pesticide claims to verify occupational case ascertainment based on a comparison of ICD-9 (international Classification of Diseases 9th Revision) diagnoses and Z-16 (USA Standard Injury) codes to cases received through the present system.
  **Action**: Currently pesticide claims are identified through computer scanning for specific words: words that end in "icide", spray, and/or fumigate. In November 1999 L&I reported that 17 additional claims were found by searching the ICD-9 codes (assigned by the physician at the clinic or hospital) and by Z-16 codes (determined by L&I) pertaining to pesticide illness. This additional search method will be done routinely by L&I and results will be forwarded to DOH for additional investigation.

- Recommendation: Review PIRT data for pesticide active ingredients involved in incidents.
  **Action**: The panel suggested DOH review the incident data for selected active ingredients with particular attention to the formulations involved in the pesticide product.

- Recommendation: Review a sample of pesticide labels involved in incidents to determine if instructions were adequate to have prevented the accident (misuse not withstanding).
  **Action**: The panel asked the agencies in 2000 to review pesticide incidents involving office buildings and commercial establishments (1995-1998) and applicable labels. Based on the results of this review other sub groups involved in pesticide incidents may be reviewed. The intent of this review is to identify how the label might have been involved in each incident. If review determines label-related factors may be involved, the panel will share such information with the EPA with recommendations for possible label changes.

- Recommendation: Establish networking capability with other states having panels with similar missions or with similar reporting systems.
  **Action**: Only one state (Oregon) has a panel similar to PIRT. Contact was made with this body to share reports and other information. In 1999, DOH briefed the panel on the extensive networking among other state and federal agencies.

- Recommendation: Review current pesticide monitoring efforts in urban surface waters.
  **Action**: The panel heard presentations from Ecology, the National Marine Fisheries Service, United States Geological Survey (USGS) and the King County Hazardous Waste Management Program on current pesticide monitoring activities. Information was distributed to panel members and interested parties.

- Recommendations: Define PIRT's role in reducing the risk of pesticide exposure in the urban environment.
  **Action**: The panel decided to identify agency involvement in urban pesticide issues and then to determine if the panel should recommend further action to reduce the risk of exposure.

## 2000 RECOMMENDATIONS OF THE PIRT REVIEW PANEL

- Prepare an analysis of incident data from 1994 through 1998.

  The agencies will provide the panel with summaries of the 1994-1998 incident data evaluated to address issues raised by the panel in 1999. Based on review of these data PIRT will identify opportunities for intervention by the agencies.

- Recommend intervention strategies including education to the agencies, using the analysis of incident data.

- Review PIRT data for pesticide active ingredients involved in incidents.

  In 2000 DOH will obtain additional information on incidents involving selected pesticide products.

- Review a sample of pesticide labels involved in incidents to determine if instructions were adequate to have prevented the accident (misuse not withstanding).

  In 1999, the panel directed the agencies to review a sub group of incidents (1994-1998) involving commercial offices. The intent of this review is to identify whether the label instructions were followed and adequate. Based on the findings of this review other incidents may be reviewed. The PIRT panel will provide the EPA with this information.

- Prepare revisions to RCW 70.104.070-090 to more accurately address pesticide issues of concern to the public, and to reflect activities of the PIRT panel.

- Identify agency involvement in urban pesticide issues and determine if the panel should recommend further action to reduce the risk of exposure.

## Introduction

RCW 70.104.090 (Appendix A) directs the PIRT Panel to centralize the receipt of information regarding pesticide complaint investigations. As mandated, this report describes PIRT activities for 1999 and evaluates 1998 pesticide incident data. The report has been reviewed and approved by PIRT.

**Table 1 1998 PIRT Panel Representatives**

| | |
|---|---|
| Department of Health (DOH): | Maryanne Guichard, Chairman |
| Department of Health (DOH): | Jane C. Lee, Coordinator |
| Department of Agriculture (WSDA): | Ann Wick |
| Department of Ecology (Ecology): | John Ridgway |
| Department of Fish and Wildlife (WSFW): | John Carleton |
| Department of Health (DOH): | Lynden Baum |
| Department of Labor and Industries (L&I): | Dan Locke |
| Department of Natural Resources (DNR): | Vacant |
| General Public: | Alice Larson, Ph.D. |
| Practicing Toxicologist: | Lucio G. Costa, Ph.D., DABT |
| University of Washington (UW): | Matthew Keifer, MD. |
| Washington Poison Center (WPC): | William O. Robertson, MD |
| Washington State University (WSU): | Allan Felsot, Ph.D. |

## 1999 PIRT Activities

PIRT met seven times in 1999 and addressed the following issues:

- New membership appointments: Alice Larson, Ph.D., general public, Lucio Costa, Ph.D., practicing toxicologist.
- In an effort to obtain additional environmental pesticide data and to stay abreast of current monitoring activities, the panel heard from several different agencies and organizations. Jim Ebert, USGS reported on a recent study of pesticides detected in urban streams during rainstorms and relations to retail sales of pesticides in King County. George Perry, King County Hazardous Waste Management Program discussed outreach and education efforts to deliver the concepts of Best Management Practices to urban pesticide users. The panel also heard from Nathaniel Scholz, NOAA on a recent study looking at whether low levels of Diazinon in water disrupt important behaviors in Chinook salmon.
- Overview of studies underway at the Pacific Northwest Agricultural Safety and Health Center, and the Center for Child Environmental Health Risks Research, at the University of Washington.
- Preparation and distribution of the 1999 Legislative Summary.
- Addressed recommendations identified in the 1998 PIRT Annual Report
- Networking with other states.

## 1998 Agency Summary Reports

Table 2 summarizes 1998 pesticide related incidents for each agency submitting data. Individual descriptions of pesticide incidents are found in Appendix D.

**Total Number of Pesticide Complaints/Incidents**
Each agency and WPC received general inquires and concerns from the public regarding pesticides. Unless these inquiries required investigation, they are not included in the *1999 PIRT Annual Report.* All pesticide related complaints are recorded and investigated by agencies in accordance with their statutory requirements (Appendix A).

In 1998, WSDA conducted 204 investigations, DOH 391, Ecology 74, L&I Washington Industrial Safety and Health Act (WISHA) 36, and L&I Claims Administration Program received 269 pesticide related worker compensation claims. Additionally, 3,002 pesticide related calls were received by WPC; 138 merited referral to DOH. Because of specific statutory responsibilities, incidents may be reported and investigated by more than one agency.

**Response Times**
RCW 70.104.080 specifically directs PIRT to monitor agency response time to pesticide related complaints. Response time is defined as the interval between initial receipt of a complaint and an agency's first response to that complaint. The first notification is usually by telephone, followed by a personal contact. In 1998, WSDA responded to 88 percent of reported complaints within 24 hours; DOH responded to 95 percent of reported incidents within 48 hours; and, L&I responded to the majority of complaints within 30 days. The three agencies have different mandates for response (Appendix A).

**Table 2 1998 Agency Summaries of Pesticide Incidents**

## Washington State Department of Agriculture: 204 complaints.

| | |
|---|---|
| Pesticide-Related Complaints | 158 |
| Violations | 87 |
| Complaints Unrelated to Pesticides | 46 |
| Violations | 29 |

Enforcement Actions

| | |
|---|---|
| ■ No Action Indicated | 87 |
| ■ Notice of correction | 68 |
| ■ Notice of Intent | 14 |
| ■ Technical assistance/verbal warning | 6 |
| ■ Administrative action | 16 |
| ■ Advisory letter/Warning letter | 12 |
| ■ Referred | 1 |

116 Violations by Type of Activity

| | |
|---|---|
| ■ Agriculture | 54 |
| ■ Commercial/industrial | 22 |
| ■ Pest Control Operator (PCO) / Wood Destroying Organism (WDO) | 8 |
| ■ Residential (homeowner) | 7 |
| ■ Right Of Way (ROW) | 12 |
| ■ Other (license/records) | 13 |

Type of License Involved with Violations

| | |
|---|---|
| ■ Commercial | 51 |
| ■ Private Applicator | 30 |
| ■ Unlicensed | 16 |
| ■ Public operator (application to public property) | 11 |
| ■ Other | 8 |

## Department of Health: 391 incidents involving 476 individual cases.

Type of Incident

| | |
|---|---|
| ■ Agriculture | 210 |
| ■ Residential | 110 |
| ■ Commercial/industrial | 33 |
| ■ Other | 38 |

Relationship to Exposure for 476 cases

| | | | |
|---|---|---|---|
| ■ Definite | 45 | ■ Unrelated | 66 |
| ■ Probable | 66 | ■ Asymptomatic | 19 |
| ■ Possible | 103 | ■ Indirect | 4 |
| ■ Unlikely | 77 | ■ Unknown | 96 |

42 Childhood Cases ≤ 18 years old

| | |
|---|---|
| ■ 19 Definite, probable, or possible | |
| ■ 23 All other classifications | |

214 Definite, Probable, or Possible Cases

| | |
|---|---|
| ■ Non agricultural | 112 |
| ■ Agriculture | 102 |

## L&I: 36 Washington Industrial Safety and Health Act (WISHA) Inspections

| | |
|---|---|
| Inspections | 36 |
| ■ Citations | 30 |

Type of Business

| | |
|---|---|
| ■ Orchard | 19 |
| ■ Other farms (e.g., berries, tree farms) | 6 |
| ■ Other (e.g., grain terminal, landscape, tree service) | 4 |
| ■ Greenhouses/nurseries | 4 |
| ■ Warehouses unloading shipping | 3 |

## L&I: 269 worker compensation claims.

| | |
|---|---|
| Agriculture | 203 |
| Non Agriculture | 66 |

Benefits Paid

| | |
|---|---|
| ■ Rejected | 100 |
| ■ Medical benefits paid | 155 |
| ■ Time loss paid | 11 |
| ■ Kept on salary | 1 |
| ■ Pending | 2 |

## Ecology: 74 pesticide complaints

## Washington Poison Center: 3,002 calls

| | |
|---|---|
| Referred to DOH | 138 |

## Washington State Department of Agriculture

The Washington State Department of Agricultural (WSDA) investigated all reported complaints involving pesticide use, sales, distribution, pesticide licensing, and building structure inspections for Wood Destroying Organisms (WDO). During 1998, WSDA investigated 204 complaints (Table 3). After investigation, 158 involved pesticide applications and 46 were complaints unrelated to pesticides.

Eighty eight percent of all complaints were responded to within 24 hours. WSDA is required to respond to cases of human exposure within 24 hours of receipt. Other cases are responded to as soon as resources allow, generally within 2-3 days.

The majority of complaints reported to WSDA occur from April to June corresponding to peak periods of applications.

**Location**

One hundred forty eight (73%) of the 1998 complaints occurred in eastern Washington; and 56 (27%) were from western Washington (Figure 1). In 1997, 119 (58%) of the complaints occurred in eastern Washington and 85 (42%) were from western Washington. Table 4 lists the counties with the most complaints from 1993 through 1998.

**Table 3 WSDA Complaints and Violations**

| Year | Total Complaints | Violations |
|---|---|---|
| 1992 | 558 | 264 (47%) |
| 1993 | 400 | 166 (42%) |
| 1994 | 383 | 138 (36%) |
| 1995 | 259 | 87 (34%) |
| 1996 | 251 | 104 (41%) |
| 1997 | 204 | 110 (54%) |
| 1998 | 204 | 116 (57%) |

**1998 WSDA Complaints by County**

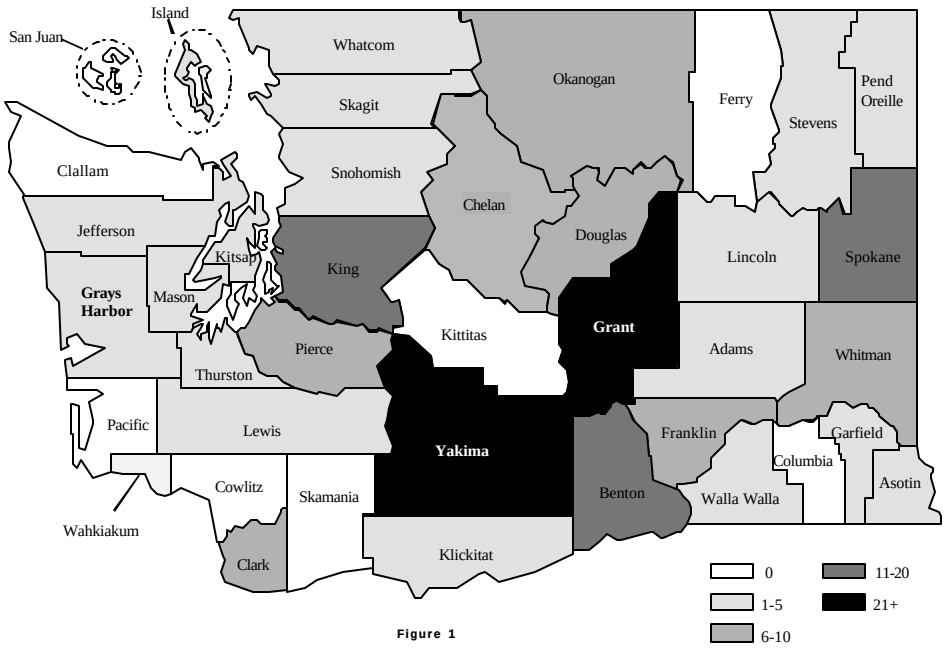


Figure 1

**Table 4 WSDA Counties with the most complaints 1993-1998**

| 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|
| Benton 52 | King 51 | Spokane 37 | Spokane 26 | Grant 24 | Yakima 28 |
| Yakima 45 | Yakima 50 | Yakima 27 | King 25 | Yakima 22 | Grant 26 |
| King 41 | Pierce 28 | King 19 | Yakima 25 | King 20 | Spokane 20 |
| Grant 28 | Franklin 24 | Skagit 17 | Grant 16 | Spokane 18 | King 14 |
| Thurston 24 | Walla Walla 23 | Grant 16 | Whatcom 14 | Pierce 13 | Benton 13 |
| Spokane 17 | Benton 19 | Pierce 16 | Pierce 13 | Benton10 | Chelan 10 |
| Clark 15 | Thurston 18 | Benton 14 | Skagit 13 | Skagit 9 | Okanogan 10 |
| Walla Walla 15 | Grant 18 | Snohomish 12 | Clark 11 | Snohomish 9 | Whitman 10 |
| Chelan 15 | | Walla Walla 12 | Benton 10 | Okanogan 8 | |

**Type of Activity Involved in Complaint**

Table 5 shows the type of activity for complaints resulting in violations from 1992 to 1998. In 1998, while the number of violation cases increased from 1997, fewer involved Pest Control Operators (PCOs) and Wood Destroying Organisms (WDOs) investigations.

**Table 5 1992-1998 WSDA Violations by Type of Activity**

| Activity | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|
| Agricultural | 158 | 75 | 46 | 26 | 29 | 40 | 54 |
| Commercial/Industrial | 32 | 60 | 44 | 24 | 27 | 22 | 22 |
| PCO/WDO* | * | * | 28 | 28 | 20 | 24 | 8 |
| Residential (non commercial) | 9 | 15 | 12 | 3 | 9 | 8 | 7 |
| Right-of Way** | ** | ** | ** | ** | 3 | 10 | 12 |
| Other (licenses, records, etc.) | 65 | 16 | 8 | 6 | 16 | 6 | 13 |
| **Total Violations** | **264** | **166** | **138** | **87** | **104** | **110** | **116** |

** Prior to 1994, PCO cases were classified as other, and in 1996, Wood Destroying Organisms were included with Pest Control Operators.*
*** Prior to 1996, right-of-ways were included with commercial/industrial.*

The following WSDA definitions apply to type of complaint:

- **Agricultural:** Incidents occur in an agricultural environment such as farming, forestry, greenhouses, or Christmas tree farming.
- **Commercial/industrial:** Incidents by licensed operators to offices, restaurants, homes, and landscapes.
- **Pest Control Operator (PCO):** Incidents involving a subset of commercial/industrial operators licensed to make applications to control structural pests.
- **Wood Destroying Organism (WDO):** Incidents involving inspections on structures for fungi, insects, and conditions that lead to pest conditions. No pesticide applications are made.
- **Residential:** Includes any application of a pesticide in a residential environment by the homeowner, resident, or neighbor.
- **Right-of-ways:** Applications made on public land such as roadways, electric lines and irrigation canal banks.
- **Other:** WSDA code for undefined use and includes licensing, storage, registration, records, and similar actions.

**Table 6 Type of License Involved with Cases Resulting in Violation**

| | |
|---|---|
| Commercial (application for fee) | 51 |
| Private applicator (application to own property) | 30 |
| Public operator (application to public property) | 11 |
| Unlicensed (general use, homeowner) | 16 |
| Other | 8 |

When violations are evaluated by type of license involved (Table 6), commercial applicators accounted for 51 of the 116 violations, followed by private applicators 30, public operators 11, unlicensed 16, and other 8. (See Appendix E for definition of license types). This reflects a continued increase in violations by commercial applicators and a decrease in violations by individual users holding private applicator licenses.

**Table 7 Type of Complaint 1997 and 1998**

| **Type of Complaint** | **1997** | **1998** |
|---|---|---|
| Drift | 50 | 62 |
| Human exposure | 42 | 52 |
| WDO Inspection | 23 | 10 |
| Direct | 21 | 13 |
| License | 14 | 12 |
| Misuse | 11 | 19 |
| Sales | | 3 |
| Animal/bird kill | 10 | 7 |
| Bee kill | 8 | 12 |
| Water contamination | 6 | 4 |
| Deliberate/deliberate misuse | 5 | |
| Notification | | 4 |
| Contaminated tanks | | 3 |
| Disposal | 3 | 2 |
| Other | 11 | 1 |
| **Total** | **204** | **204** |

Table 7 shows the type of complaints. Drift and human exposure were the primary reasons for pesticide related complaints. This is consistent with prior years and illustrates the need for applicators to be consistently aware of the importance of not letting an application drift.

Pesticide complaints frequently result from an application going off target. Table 8 lists the most common sites where the pesticide originated or was applied, and the source of the complaint. Drift complaints from agricultural applications generally were about drift onto crops or people. Drift complaints reported from non-agricultural applications concern health or environmental risks. Incidents were evaluated by target and complaint site. The following observations were made.

- In Eastern Washington agriculture, pesticides applied to apples and other tree fruits, and to potatoes generated the most frequent investigations that resulted in violations.
- For non-agricultural applications in Eastern Washington, applications for lawn and ornamental pest control and Right-of-way (highways, railroads, and ditches) generated the most complaints resulting in violations.
- In Western Washington, most of the complaints from agriculture were applications to row crops or hay.
- House inspections or applications to control structural pests generated the most non-agricultural violation complaints in Western Washington.
- Most of the Eastern Washington violation cases concerned drift to persons, vehicles or property. Violations concerning drift to certified organic crops are also beginning to be more frequent as acreage increases.

- Western Washington violations are divided between drift to persons or property and false Wood Destroying Organism inspections. The majority of these are claims that a property either does not have WDO problems when they actually do, or that problems have been corrected when they have not, rather than unneeded applications or reported non-existent infestations. Pressure is exerted on real estate transactions to move rapidly through financial institutions without delay to correct WDO problems. Most of the complaints concerning Wood Destroying Organism inspections cannot be investigated on site by WSDA because of staff limitations. WSDA will investigate where possible if sufficient evidence of a possible violation remains, otherwise the case is handled by phone with Technical Assistance given to the individual. Therefore, the actual number of investigations is a small part of the problems seen. WSDA is working on regulatory changes to partially address this.
- As in previous years, the more serious human health problems occurred from applications applied to tree fruits drifting on unprotected workers in adjacent areas.

**Table 8 WSDA Comparison of the Most Frequent Target and Complaint Sites 1998**

| Agriculture | | | | Non Agriculture | | | |
|---|---|---|---|---|---|---|---|
| **Eastern WA** | | **Western WA** | | **Eastern WA** | | **Western WA** | |
| **Target Site** | | | | | | | |
| Apples | 14 | Row Crops | 3 | Lawns/Ornamentals | 9 | House/Structure | 12 |
| Potatoes | 6 | Hay | 2 | Right-of-way | 9 | Lawns/Ornamentals | 8 |
| Pears/Cherries | 4 | Weeds | 1 | Mosquitoes | 3 | | |
| Wheat | 3 | Corn | 1 | House/Structure | 3 | | |
| Row Crops | 3 | | | | | | |
| **Complaint Site** | | | | | | | |
| Persons | 14 | Persons | 2 | Persons | 13 | House | 9 |
| Vehicles | 5 | Row Crops | 2 | Lawns/Ornamentals | 8 | Lawns/Ornamentals | 7 |
| Bees | 5 | | | Trees | 7 | Persons | 3 |
| Trees | 4 | | | Property | 6 | Property | 2 |
| Organic Crops | 3 | | | | | | |
| Animals | 3 | | | | | | |

The following example illustrates the potential severity of complaints reported to WSDA.

***WSDA #13-G-98 and DOH 980176***
*Ten female orchard workers were drifted on by an aerial application of insecticide to an adjacent potato field. All went to a local emergency room. Two were admitted to the hospital and three stayed until the next day but were not admitted. Five went home later the same day and five went home the next day. Symptoms included numbness in the mouth, headache, throat and eye irritation. Some were given Atropine in the emergency room. The aerial applicator apparently flew over the orchard but testimony varies on the actual application path and amount released. Results for pesticide residues were positive. The following pesticides were involved: carbaryl, methamidophos, sulfur, triphenyltin hydroxide and adjuvants. DOH classified the cases: 10 Definite, Severity: 3 severe, 4 moderate, and 3 mild.*

***WSDA 14-C-98, DOH 980268 and L&I 300900065***
*Seven out of seventeen workers reported mild symptoms after smelling pesticides from a ground application of insecticide to an adjacent orchard block. Three reported having contact with the pesticide mist. Two individuals were admitted to the intensive care unit of a local hospital and one was seen in the ER. Clothing samples from the workers and plant samples from claimants work area were positive for residues. Actual source of the pesticides is not definitive. Final case results are pending. DOH classified the cases: 2 Probable, 5 Possible, Severity: 2 severe, 1 moderate, 4 mild.*

***WSDA # 54Y-1998 and DOH 980398*** *Two workers reported feeling ill after an application of crack and crevice insecticide spray was made in their employee break room while they were present. The complaint was referred to DOH. WSDA advised the applicator not to spray when people are present and to give notice before the application. The label (NorAm Ficam W - Bendiocarb) does not require notification of people in the vicinity of the application or that the area be vacated (for indoor applications). The application was made in accordance with the label instructions. DOH Classified the cases: Definite 2, Severity 2 mild.*

**Pesticide application method involved in complaint**

Since 1989 WSDA has tracked the application method involved in complaints (Table 9). In 1990, the number of complaints about aerial applicators dropped sharply. This was probably due to the effectiveness of increased aerial regulations in Eastern Washington. From 1990 to 1994, complaints about known aerial applications averaged about 50 per year. (Since the majority of applications are ground, they generate a higher number of complaints. Ground applications also are used in areas where there are more people).

**Table 9 Pesticide Application Method Involved in Complaint**

| Pesticide Application Method | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|
| Air | 30 | 29 | 32 | 38 |
| Ground | 126 | 121 | 121 | 104 |
| No Application | 39 | 85 | 41 | 51 |
| Unknown | 64 | 16 | 10 | 11 |

**How serious were these complaints?**

In 1996, WSDA developed a severity rating scale for all complaints. The purpose of the rating scale was to assess the severity of each complaint and to track the reported severity of all complaints over time using a consistent measure. With increased education and use of more targeted pesticides, the severity of reported incidents on this rating system should decrease. Another reason for looking at severity of all complaints is because of the wide variety of reported complaints. Some complaints do not involve pesticides (i.e., licensing issues), while others allege serious health effects or economic damage. A consistent measurement was needed to accurately reflect on the severity of violation in terms of health or damage. The criteria used to assign ratings takes into account DOH determinations (if human exposure occurred), environmental and economic damage, and compliance with regulations.

For the third year (1998), the majority (80%) of all pesticide related complaints reported to WSDA were determined to have a low severity rating of two or less (Table 10). A rating of two means: residues may have been found but no human or animal symptoms resulted or could be verified; multiple minor violations may have been identified; off label use; worker protection violations; plants with temporary or superficial damage; PCO/WDO faulty inspections; or DOH classified the complaint as "possible". Although there may have been violations associated with these investigations, individuals were generally given Notices of Correction or Verbal Warnings rather than fines or suspended licenses. In 1997, 78 percent of all complaints and in 1996, 85 percent had a severity rating of two or lower. In 1997, the higher percentage of more severe cases reflect a series of animal poisonings (primarily dogs) from strychnine, some human exposure cases where the individuals were taken to hospital emergency rooms for care following pesticide exposure and some incidents involving bee kills.

The following table lists the severity of the 1996 through 1998 WSDA complaints and the criteria used in making the determination.

**Table 10 Severity Rating of WSDA Complaint Cases 1996-1998**

| Rating | 1996 | 1997 | 1998 | Criteria |
|---|---|---|---|---|
| **0** | **64** | **28** | **31** | Problem not due to pesticides and/or no cause determined; PCO/WDO inspection with no violations. |
| **1** | **71** | **67** | **62** | Pesticides involved, no residue, no symptoms occurred; possible pesticide problem, not substantiated; issues involving records, registration, posting, notification (multiple chemical sensitivity) or licensing; DOH classified "unlikely" or "unknown." |
| **2** | **79** | **64** | **70** | Residue found, no health symptoms (human, animal); health symptoms not verified; multiple minor violations; off label use; worker protection violations; PPE violations with no health symptoms; plants with temporary or superficial damage only; PCO/WDO faulty inspections; DOH classified "possible." |
| **3** | **22** | **30** | **31** | Minor short-term health symptoms (rash, eye irritation, shortness of breath, dizzy, nausea, vomiting); bee kills less than 25 hives; minor fish kills; economic plant damage under $1000; evidence of deliberate economic fraud; DOH classified "probable." |
| **4** | **11** | **8** | **9** | Short-term veterinary or hospital care; bee kills over 25 hives; significant fish kills; significant economic plant damage over $1000; environmental damage; illness involving children; DOH classified "probable." |
| **5** | **4** | **7** | **1** | Veterinary or hospital care, overnight or longer; physician diagnosed children's illness as caused by pesticides; animal death due to pesticides; significant environmental damage; DOH classified "definite." |
| **6** | **0** | **0** | **0** | Human death due to pesticides. |
| **Total** | **251** | **204** | **204** | |

**Type of Pesticide Involved in Complaint**

In 1998, herbicides were involved in 92 complaints and insecticides in 71 complaints. Other products such as fungicides, disinfectants and rodenticides were involved less frequently. Many cases involve tank mixes of several products and therefore the total number of products used exceeds the cases investigated. Pesticides were not applied in 46 cases.

The same general types of pesticide active ingredients were involved in violation cases during 1998 as in previous years with ten or more separate complaints involving: 2,4-D (28), glyphosate (17), and azinphos-methyl (10).

## WSDA Enforcement Action

In 1998, 116 of the 204 total complaints resulted in violation. Table 11 lists the type of agency actions taken. Notices of correction and advisory or warning letters were the most frequent corrective action taken by WSDA.

**Table 11 1998 WSDA Agency Actions**

| | |
|---|---|
| No Action Indicated | 87 |
| Technical Assistance | 1 |
| Verbal Warning | 5 |
| Advisory letter/Warning letter | 12 |
| Notice of Correction | 68 |
| Notice of Intent | 14 |
| Administrative Action | 16 |
| Referred | 1 |
| Total Investigations | 204 |

**Other Agencies Involved**

WSDA consults with other state, federal, and local agencies and jurisdictions. In 1998, WSDA consulted with other agencies on 77 investigations.

**WSDA Observations**

WSDA has observed a continued increase in violations by commercial applicators and a decrease in violations by individual users holding private applicator licenses. This may be an indication that there are more applications made by commercial businesses and fewer by individual producers as equipment and application techniques become more sophisticated and expensive.

In recent years WSDA has noticed an increase in the number of complaints related to Wood Destroying Organisms treatment and inspection. Making determinations about wood destroying organisms inspections are particularly difficult for homeowners. Most people do not have the training to correctly identify insects and fungi and are reluctant (or unable) to crawl under the house to verify the inspection report. WDO complaints generally fall into three groups: work not done, insects not correctly identified, and work that was not needed. WSDA is contacted months or even years after a WDO inspection when problems not corrected become visible. Most of the complaints concerning WDO inspections cannot be investigated on site by WSDA because of staff limitations. WSDA will investigate if sufficient evidence of possible violation remains, otherwise the case is handled by phone with Technical Assistance given to the individual. Therefore, the number of investigations is a small part of the actual problem. WSDA is working on regulatory changes to address this issue.

Since 1993, the total number of pesticide complaints reported to WSDA has decreased while the number of complaints related to WDO has increased and are an increasing proportion of the total. Several factors may be involved such as; more awareness by applicators in reducing risks, more education and enforcement, reduction in the use of more toxic products, increased cost of products and a desire to hire professional applicators.

## Department of Ecology

The Department of Ecology (Ecology) investigates complaints involving threats to air, water or soil. In 1998, Ecology reported 74 pesticide-related complaints. Sixty-six came through the agency's "Emergency Report Tracking System," (ERTs) managed by the Emergency Planning, Preparedness and Response Program, and 8 were reported through the Toxic Cleanup Program's Contaminated Sites database.

Complaints were reported from 21 of the State's 39 counties: 10 from western Washington, 11 from eastern Washington. Of the 74 total cases, 45 were in western Washington, 29 were in eastern Washington.

Of the 66 pesticide related complaints reported through the Emergency Report Tracking System, 11 triggered a field response and/or an investigation, 15 were referred to other state or local agencies, 18 were resolved with a telephone call, and 22 complaints lacked enough information for follow-up. Although there is no indication that any of these complaints involved serious or direct exposure to human health or the environment, it is possible that some of those that were referred to other agencies could have had potential human or environmental risks.
In 1998, eight sites involving pesticide contamination were added to the register of contaminated sites, four will be evaluated through the 'site hazard assessment' process and four are being evaluated through the 'risk assessment' process. These sites concern contamination of: groundwater (3), drinking water (2), soil (2) and sediments (1).

## Department of Fish and Wildlife

The Department of Fish and Wildlife is mandated to preserve, protect and perpetuate fish and wildlife. Complaints involving fish or wildlife kills are generally reported to the Oil Spill Response Team (Spill Team). These reports usually come through DCTED (Department of Community Trade and Economic Development), Emergency Management Division (EMD), but can also be from private citizens. Overwhelmingly, the reports involve contaminants other than pesticides, natural die-off or low dissolved oxygen levels in marine or fresh water. The EMD also sends these reports directly to Ecology.

In the past eight years, the Spill Team has received only four or five pesticide incident reports, all of which were forwarded to the U.S. Fish and Wildlife Service. The Spill Team is funded for oil spill response only, and since the agency has no regulatory authority over pesticide use, there are no staff dedicated to investigating pesticide/wildlife interactions.

## Department of Health

The Department of Health Pesticide Program is responsible for investigating reports of illness related to pesticide exposure. Data collected from the investigations are used to identify public health problems and to develop strategies for prevention.

The DOH portion of the PIRT Report has four sections. Section 1 gives an overview of the number and nature of cases investigated by DOH Pesticide Program in 1998. Section 2 reviews occupational cases; Section 3 reviews agricultural cases; Section 4 evaluates incidents in urban and suburban use of pesticides; and Section 5 reviews childhood pesticide cases.

### Section 1: Number and Nature of DOH Investigations

For 1998, the Pesticide Program received 391 reports of incidents involving 476 individuals exposed to pesticides (Figure 2). This is a slight increase over 1997. The majority (81%) of suspected pesticide incidents occurred in the six months between April and September. The time of year of reports is consistent with previous years.

**Reported Incidents and Cases 1993-1998**

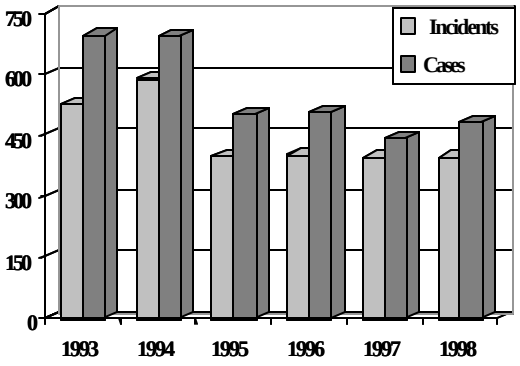


Figure 2

Reports of suspected pesticide illness were received from L & I claims (49%), WPC (33%), WSDA (9%), Health Care Providers (4%), individuals (3%), and others (2%). Most health care providers find it more convenient to report through the WPC. In 1998, DOH responded within 48 hours to 95 percent of reported illness.

### Classification of Investigated Cases

Investigators of the Pesticide Program interview individuals and witnesses (when appropriate), obtain pesticide application and relevant medical records, and conduct field visits. This information is used to classify a case as to how likely the symptoms relate to the exposure. Classification depends on how verifiable the exposure and illness are through documentation or witnesses. Each case classification is reviewed centrally. Definitions of the eight classifications are found in Appendix C. Figure 3 shows the distribution of case classifications.

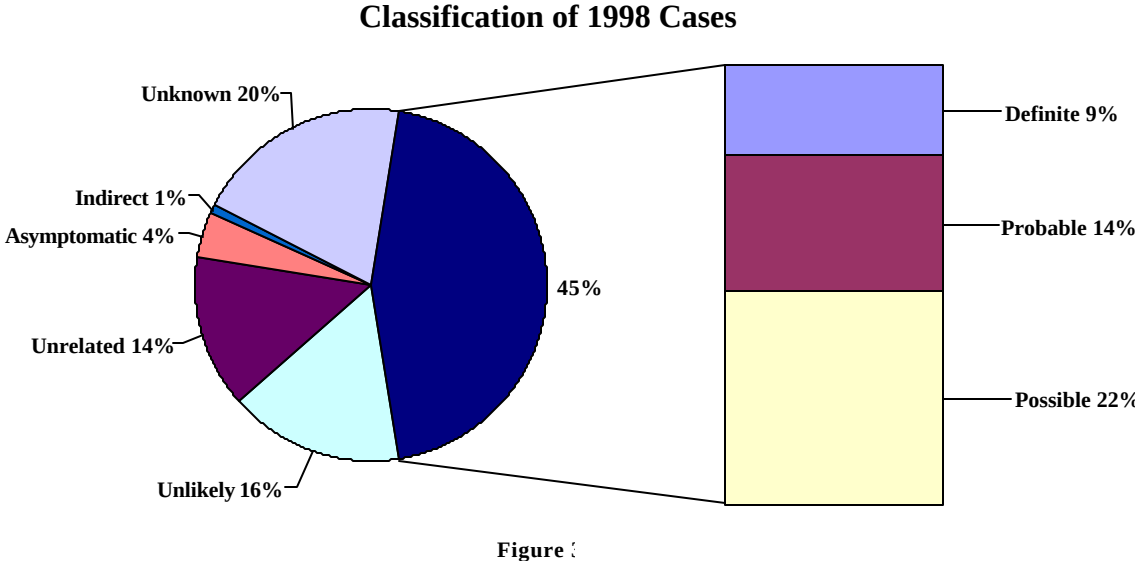


**Figure 3**

In 1998, 214 (45%) of the reported cases were determined to be definitely, probably, or possibly related to pesticide exposure. This compares with 49% in 1997, and 47% in 1996 (Table 12). When the asymptomatic rodenticide cases (which were not investigated after 1994 forward) are removed from the 1994 data, the 1994 percentage of definite, probable, or possible cases is comparable (41%) to 1995 data.

**Table 12 1992 - 1998 Definite, Probable and Possible Case Classification**

| **Classification** | **1992** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** |
|---|---|---|---|---|---|---|---|
| Definite | 20 | 53 | 41 | 38 | 37 | 36 | 45 |
| Probable | 72 | 141 | 79 | 46 | 81 | 78 | 66 |
| Possible | 91 | 157 | 90 | 132 | 119 | 100 | 103 |
| **Total DPP** | **183** | **351** | **210** | **216** | **237** | **214** | **214** |
| Percent | 50% | 50% | 30% | 43% | 47% | 49% | 45% |
| **All cases reported** | **365** | **696** | **691** | **503** | **504** | **441** | **476** |

## Nature of Pesticide Exposure

Of the 214 cases related to pesticide exposure, 91 were associated with agricultural applications, 55 were residential, and 18 involved applications to commercial buildings or other situations. (Table 13). Thirty-eight exposures did not involve applications (e.g., intentional or inadvertent ingestion by children, and exposures at pesticide retail and wholesale sites). DOH observed a decrease in number of cases occurring as a result of applications to commercial buildings such as schools, offices or their grounds, and an increase in exposures which did not involve an application. This increase resulted from one incident where13 people were exposed to a pesticide spill in a thrift store.

**Table 13 1997 & 1998 DOH Cases by Type of Application (definite, probable, possible)**

| Type of Application | 1997 | 1998 |
|---|---|---|
| Agricultural applications | 93 (43%) | 91 (43%) |
| Non agricultural applications: | | |
| Residential applications | 64 (30%) | 55 (26%) |
| Applications to commercial buildings, schools, offices, or their grounds | 41 (19%) | 18 (8%) |
| other applications | 9 (4%) | 11 (5%) |
| Exposure did not involve an application | | |
| Agricultural | 8 (4%) | 11 (5%) |
| Non Agricultural | | 28 (13%) |
| **Total** | **214** | **214** |

Seventy-one (33%) exposures resulted from direct contact with a pesticide while mixing/loading or applying (Table 14). Sixty-four cases (30%) involved pesticide drift from application site. Thirty-three (16%) resulted from contact with either airborne or surface residues after an application was completed.

**Table 14 1998 DOH Cases by Type of Exposure (definite, probable, possible)**

| Circumstances of Exposure | Cases | Percent |
|---|---|---|
| Direct exposure while handling pesticide | 71 | 33% |
| Drift | 64 | 30% |
| Exposure to residues | 33 | 16% |
| Accidents | 26 | 12% |
| Ingestion | 3 | 1% |
| Other | 17 | 8% |
| **Total** | **214** | **100%** |

**Number of Persons Involved**

The majority (91 percent) of 1998 incidents involved one individual. Thirty-four incidents involved two or more people. Examples of incidents involving five or more individuals follow:

***DOH # 980176*** *Ten female farmworkers developed symptoms while working in an orchard. (Listed on page 11 in the WSDA section.*

***DOH # 980023*** *A bottle of 90 percent malathion concentrate fell and broke in the sorting area of a thrift store. Thirteen employees complained of temporary symptoms; including headaches, and nausea. All 13 people went to a local emergency room for treatment and four were given oxygen. DOH Classification: definite 4, probable 9, Severity: mild 13.*

***DOH # 980268*** *Seven of 17 workers developed symptoms after smelling pesticide from an application conducted in another section of the orchard. (Listed on page 11 of the WSDA section).*

***DOH # 980065*** *Members of two households reported itchy skin and other mild symptoms after drinking and bathing in water contaminated with dinoseb. Levels of 300 to 500 ppb were confirmed in drinking water supplies by the Department of Ecology. The shallow well was contaminated when a water pipe broke causing leaching from nearby soil contamination at a mixing and loading site. DOH Classification: possible 4, asymptomatic 1, Severity mild 4, asymptomatic 1.*

## Location

All but six counties in Washington had reports of pesticide illness. Table 15 lists the ten counties with the most reported incidents. Seventy-six percent of all reports come from these top ten counties.

**Table 15 Top Ten Counties with Reported Incidents in 1998**

| County | Incidents | Individuals |
|---|---|---|
| Yakima | 79 | 94 |
| King | 43 | 56 |
| Grant | 28 | 42 |
| Okanogan | 26 | 39 |
| Benton | 21 | 25 |
| Chelan | 21 | 23 |
| Snohomish | 19 | 22 |
| Pierce | 17 | 22 |
| Franklin | 18 | 21 |
| Spokane | 19 | 19 |

Figure 4 shows the location of definite, probable, or possible cases for 1997 and 1998.

**Combined 1997 - 1998 County Distribution of Cases**

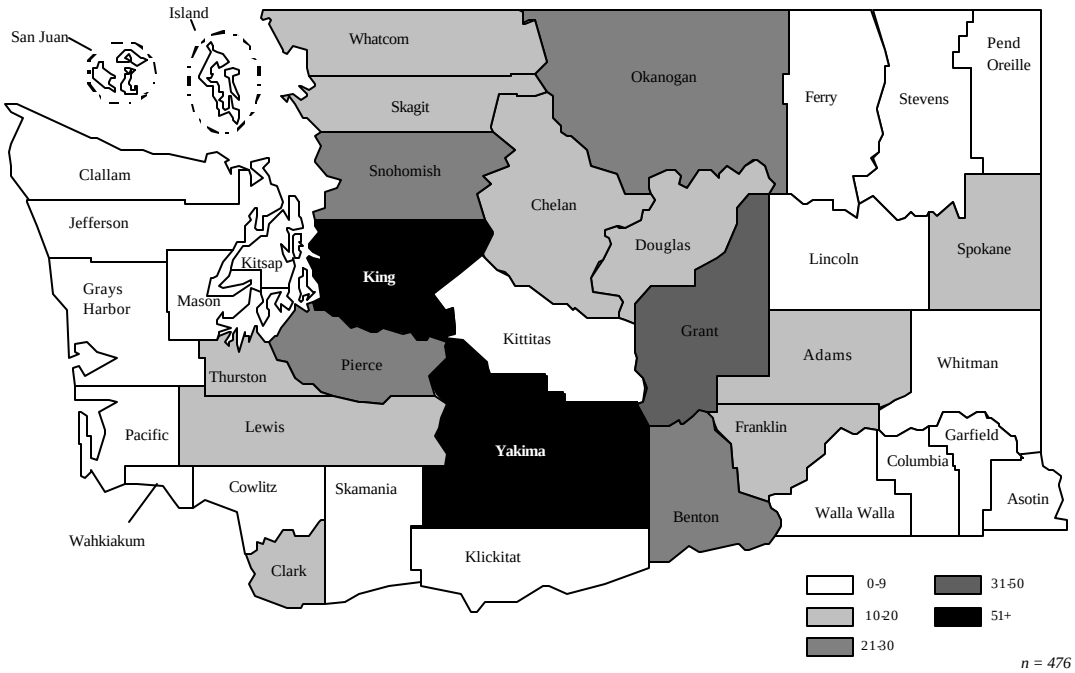


Figure 4

**Severity of Medical Outcome**

In 1995, DOH began coding cases according to the severity of health outcome (see Appendix C for a description of severity codes). In 1998, (Figure 5), the majority (95%) of cases had mild or moderate medical outcomes. Ten cases were classified as severe. Four of these were hospitalized and are described below. Also described is an incident in which seven workers were kept overnight for observation and two were admitted.

**Severity for 1995-1998**

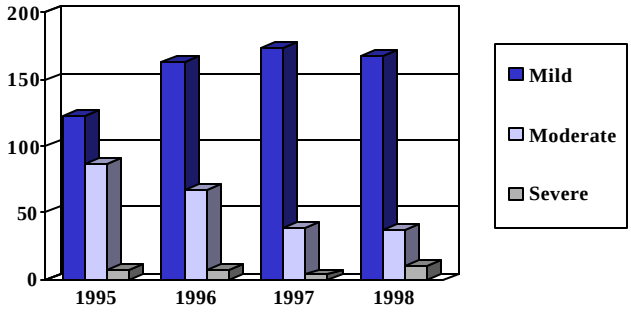


Figure 5

**DOH # 980007**

*Listed on page 27, Incidents Involving Children.*

**DOH # 980225**

*A 39-year-old man was working in his garage when a quart of insecticide (chlorpyriphos) spilled on his head and clothing. He immediately showered in his clothing but developed symptoms of organophosphate poisoning within 3 hours (shortness of breath, nausea, diarrhea, muscle weakness and cramping, and excessive salivation). He was treated with atropine and 2-PAM, and admitted to a hospital ICU. DOH classification: definite, Severity: severe.*

**DOH # 980295**

*A 47-year-old was found with confusion and incoherence 8 hours after he and roommates used excessive aerosol insecticide (methyl carbamate, chlorpyriphos, cypermethrin) to kill bees in their home. He was hospitalized over night. Other medical issues were involved. DOH Classification: possible, Severity: severe.*

***DOH # 980373***

*A 33 year old man with a history of asthma developed severe asthma symptoms after entering his apartment that had been treated with three "miniature cans" of flea spray (cypermethrin, orthoboric acid). The room had been aired for 8 eight hours. He was treated and admitted to the hospital ICU for 24 hours and discharged 3 days later. DOH classification: definite, Severity: severe.*

***DOH # 980176***

*Ten female farmworkers developed symptoms while working in an orchard. An aerial applicator drifted carbaryl, methamidophos, sulfur, triphenyltin hydroxide and adjuvants. Most had numbness in the mouth, headache, throat and eye irritation. They washed approximately one hour after feeling the spray. They all went to a hospital emergency room. Three were kept overnight for observation and two were admitted. WSDA tests were positive for residues in areas they were working and positive for some clothing samples. DOH Classification definite 10, Severity: severe 3, moderate 4, mild 3. WSDA 15G-98.*

**Pesticide Products Involved In All Cases**

DOH defines a causal product as a chemical formulation which includes the pesticide active ingredients and inert (carriers, adjuvants, solvents, synergists, etc.). The entire formulated product is considered in the investigation. Sixty-six cases involved tank mixes of two or more

casual products. While reviewing data for the number of different causal products, approximately 122 different causal products were found. A few products were involved with slightly more frequency such as 2,4-D, glyphosate, and azinphos-methyl.

Table 17 shows the relationship between pesticides involved in definite, probable and possible cases in agricultural and non-agricultural settings. Insecticides were involved in 60% of the cases. More cases classified as definite occurred in agriculture, while more probable and possible cases occurred in the non-agricultural environment, and more organophosphate insecticide cases occurred in agriculture. This is consistent with the use of agricultural pesticides that have a higher percentage of active ingredients.

## Section 2: Occupational Cases of Pesticide Related Illness

In 1998, sixty seven percent (319) of all reported cases investigated by DOH involved a pesticide exposure on-the-job. Of these, 144 were classified as definite, probable or possible. Eighty-eight involved agricultural workers and 56 were from other occupations.

Figure 6 shows DOH agricultural and non-agricultural occupational case classifications from 1992 to 1998. The peak of agricultural occupational cases in 1993 is attributable to two unique circumstances: workers exposed to Phosdrin and an agricultural drift incident. Since 1994 the annual number of occupational definite, probable, or possible pesticide related agricultural cases has remained steady at around 80.

**Agricultural and Non-Agricultural Occupational Cases**
**1992 through 1998**

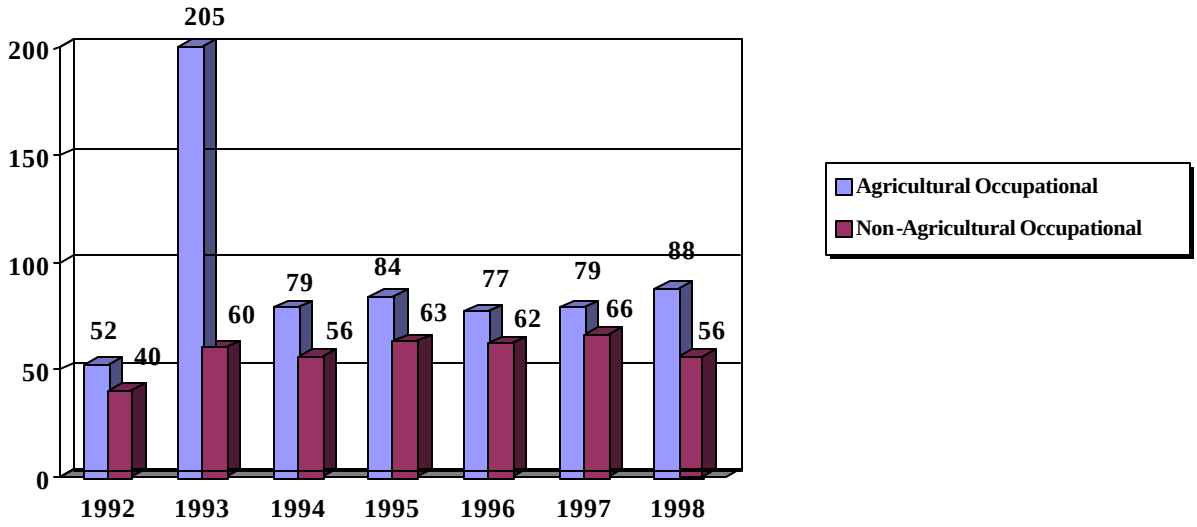


Figure 6

Table 17 shows the occupation of workers involved in DOH cases. Among agricultural workers, those who directly handled pesticides (e.g., mixers, loaders, applicators) were at highest risk for direct exposure, and accounted for 31 (35%) reported illnesses in 1998. Pesticide drift onto agricultural workers accounted for 35 cases (40%). The remaining 23 (26%) were thinners, irrigators, and other agricultural workers exposed either to residues on foliage or by accident (e.g. a hose ruptures).

Other occupational groups exposed while directly handling pesticides included: exterminators, lawn and garden care professionals, and building and grounds maintenance workers. Each year, non-agricultural workers are exposed to workplaces that have been treated with pesticides. Office workers and restaurant/bar employees frequently report this type of exposure.

**Table 17 Occupations of Pesticide Cases in 1996 - 1998 (definite, probable, possible)**

| ***Agricultural Workers*** | **1996** | **1997** | **1998** |
|---|---|---|---|
| Pesticide applicators/mixers/loaders | 39 | 37 | 33 |
| Thinners | 21 | 7 | 16 |
| Harvesters | 1 | 8 | 0 |
| Cleaning/fixing equipment | 3 | 1 | 2 |
| Irrigators | 1 | 5 | 1 |
| Other worker | 9 | 18 | 30 |
| Nursery/greenhouse worker | 3 | 3 | 7 |
| ***Non Agricultural Workers*** | **1996** | **1997** | **1998** |
| Commercial pesticide applicators *(licensed for structural or landscape pest control)* | 7 | 4 | 8 |
| Property maintenance staff *(janitors, housekeepers, grounds maintenance)* | 7 | 12 | 10 |
| Employees at places of pesticide retail *(loading dock workers, stockers, cashiers)* | 11 | 6 | 3 |
| Employees repackaging pesticide for wholesaler | 8 | 0 | 0 |
| Office workers | 11 | 27 | 13 |
| Miscellaneous indoor workers | 16 | 10 | 17 |
| Miscellaneous outdoor workers | 2 | 7 | 4 |
| **Total** | **139** | **145** | **144** |

Table 18 shows how the occupational cases occurred, both in the agricultural and non agricultural work place. Agricultural occupational exposures to drift accounted for 35 of the 89 definite, probable and possible cases.

**Table 18 1997 and 1998 Circumstances of Occupational Pesticide Exposure (definite, probable, possible)**

| **Nature of Exposure** | **Agricultural** | | **Non Agricultural** | |
|---|---|---|---|---|
| **Exposed while handling pesticide product:** | 1997 | 1998 | 1997 | 1998 |
| applying with vehicle mounted equipment | 26 | 25 | 2 | 1 |
| applying with handheld equipment | 5 | 2 | 12 | 16 |
| applying other | 2 | | 1 | |
| mixing/loading for any application | 7 | 4 | - | 1 |
| fumigation in field manufacturing | 1 | 1 | 1 | |
| **Exposure to surface residues or residual volatiles in:** | | | | |
| agricultural field or greenhouse | 20 | 15 | - | 1 |
| yards, landscapes | - | | 5 | |
| building, other structures | 1 | | 25 | 8 |
| **Exposed while cleaning/fixing equipment** | 2 | 1 | 1 | 1 |
| **Exposed to pesticide drift** | 13 | 35 | 12 | 7 |
| **Accidents (spills, etc.)** | 2 | 5 | 5 | 18 |
| **Other/unknown** | - | | 3 | 3 |
| **Total** | **79** | **88** | **66** | **56** |

## Section 3: Incidents Involving Agriculture

Fifty-five percent (218) of the total number of pesticide related exposure reports in 1998 occurred in an agricultural setting and involved 258 individuals. One-hundred-two (40%) agricultural related illnesses were classified as definitely, probably, or possibly related to pesticides. Eighty-eight of these were occupational and 14 involved individuals not working at the time of exposure. All 14 non-occupational agricultural cases were mild in severity. The 14 cases resulted from the following routes of exposure: drift 8, five from well water contamination, and one became ill from smelling an application. Individuals in 86 of the 88 occupational cases were involved in the production of an agricultural product. Two persons were involved in the manufacturing/production of a pesticide product. Table 19 shows the number of occupational cases by agricultural product.

**Table 19**
**1997-1998 Occupational Cases by Type of Agricultural Product**
**(definite, probable, possible)**

| Agricultural Product | 1997 | 1998 |
|---|---|---|
| Fruit | 49 | 44 |
| Field crops | 14 | 29 |
| Nursery/greenhouse | 5 | 11 |
| Livestock | 3 | 1 |
| Forest | 2 | 0 |
| Other | 1 | 2 |
| **Total** | **74** | **86** |

Consistent with prior years, the largest number (44 or 51%) of agricultural occupational definite, probable, or possible cases occurred in the tree fruit industry, primarily apples. Thirty-one cases involved field crops, of which 18 cases resulted from drift.

Application of pesticides, either with vehicle mounted or handheld equipment, accounted for 26% of the 102 agricultural related pesticide illnesses, a 10% reduction from 1997. Forty-two percent of reported illness resulted from pesticide drift and 14% from exposure to residues.

**Table 20 Job Activity and Exposure Relationship Associated with Agricultural Production Types 1998**

| | Type of Agricultural Production | | | | | | |
|---|---|---|---|---|---|---|---|
| | Relationship to Exposure | | | | | | |
| | Def/Prob | Pos | Def/Prob | Pos | Def/Prob | Pos | |
| **Job Activity** | **Field Crops** | | **Fruit Production** | | **Other**** | | **Total** |
| Applicator | 4 | 4 | 8 | 11 | 1 | | **28** |
| Farm work/general | 10 | 7 | | 3 | 1 | 1 | **22** |
| Thinning/tying branches | | | 4 | 12* | | | **16** |
| Mixer/loader | 2 | | 3 | | | | **5** |
| Nursery worker | | | | | 5 | 2 | **7** |
| Irrigation | 2 | | | | | | **2** |
| Other | | | 1 | 2 | 3 | 2 | **8** |
| **Total** | **18** | **11** | **16** | **28** | **10** | **5** | **88** |

**Orchard workers tying tree limbs were drifted by a application made to potatoes.*
********Includes nursery and greenhouse workers*.

Sixty-nine percent of agriculturally related cases had outcomes considered mild. Twenty-five percent were moderate and 6 percent were severe. The severe cases involved a direct exposure to an applicator, and five drift exposures in fruit and field crops.

**Exposure to Field Residues**

In agricultural cases, pesticide exposure occurs from three primary sources: ground application, field residues and drift. Each of these pathways of exposure requires different strategies for prevention. Ground application cases generally result when workers are not wearing appropriate personal protective equipment (PPE).

**Table 21 Comparison of Source of Pesticide Exposure 1996-1998**

| Exposure Activity | 1996 Agric | 1996 Agric Def, Prob Poss | 1997 Agric | 1997 Agric Def, Prob, Poss | 1998 Agric | 1998 Agric Def, Prob, Poss |
|---|---|---|---|---|---|---|
| Residue field | 100 | 12 | 76 | 23 | 88 | 14 |
| Residue structure | 1 | 1 | 1 | 1 | 1 | |
| Ground Application | 61 | 29 | 41 | 27 | 61 | 25 |
| Drift | 57 | 30 | 47 | 22 | 71 | 43 |
| Pack/processing | 1 | - | 21 | - | | |
| Hand Application | 13 | 4 | 7 | 5 | 6 | 2 |
| Accident | 5 | 4 | 5 | 2 | 6 | 5 |
| Clean/fix | 5 | 3 | 5 | 2 | 2 | |
| Mix/aerial | 3 | 3 | - | - | | |
| Mix/loading ground | - | - | 9 | 6 | 7 | 4 |
| Mix/load hand | - | - | 1 | 1 | | |
| Aerial mixing/loading | 1 | 1 | - | - | | |
| Air application | 1 | - | - | - | 1 | |
| Other application | 1 | 1 | 2 | 2 | | |
| Fumigation field | - | - | 2 | 2 | | |
| Other | 8 | - | 3 | - | 13 | 9 |
| Unknown | 3 | - | 3 | - | 2 | |
| **Total** | **262** | **97** | **223** | **93** | **258** | **102** |

## Section 4: Urban/Suburban Cases of Pesticide Related Illness

Of the 476 cases investigated in 1998, 218 were associated with non-agricultural pesticide use. DOH considered 112 (52%) of these to be definitely, probably, or possibly related to pesticide exposure (Table 22). Thirty-eight cases (34%) involved exposures to the applicator. Seventy-eight occurred at residential or commercial sites (i.e., homes, apartments, office buildings, and restaurants). Thirty-two percent of the 78 cases involved an application by a professional PCO or lawn care service. The remaining cases were associated with pesticides applied by a homeowner, co-worker, or other unlicensed person.

**Table 22 1998 DOH Source of Exposure for Non Agricultural Pesticide Use (definite, probable, possible)**

| Source of Exposure | Cases |
|---|---|
| ***Applications to:*** | |
| Residential building or grounds (home apartment) | 60 |
| Commercial building or grounds (offices, restaurants, hotels) | 18 |
| Public park | 2 |
| Roadside/Industrial | 6 |
| ***Other exposures***: | |
| Spilled at resale shop | 13 |
| Other | 13 |
| **Total for all non-agricultural pesticide use** | **112** |

Table 23 shows the pest targeted by applications at 62 residential or commercial sites involving 78 individuals. Fifty-six percent of these cases involved use in and around structures, 37 percent involved landscape or garden use of pesticides, and 6 percent involved applications directly to pets, skin or hair.

**Table 23 Target Pest for 1998 Cases[1] Associated with Pesticide Applications at Residential and Commercial Sites**

| Subject of Application | DOH Cases Associated with Use |
|---|---|
| ***Landscape/garden use:*** | |
| Weeds | 12 |
| Insects | 10 |
| Repelling cats | 1 |
| ***Use in/around structures:*** | |
| Termites | 2 |
| Fleas | 8 |
| Ants | 6 |
| Flies | 2 |
| Insect unspecified or other | 5 |
| Bees/wasps /yellow jackets | 7 |
| Wood Destroying Organisms | 2 |
| Mold/moss | 3 |
| ***Applications to people:*** | |
| Lice creams/shampoos | 4 |
| **Total** | **62** |

[1] Definite, Probable and Possible Cases

As in the previous two years, insecticide exposure was involved in the majority (62%) of DOH non-agricultural incidents. Illnesses associated with herbicide use accounted for 23% of incidents. The most common insecticides involved were Pyrethrins and synthetic pyrethroids (e.g., cyfluthrin, esfenvalerate, permethrin) and organophosphates and carbamates (e.g., chlorpyrifos, propoxur).

## Section 5: Incidents Involving Children

Forty-two individuals 18 years of age and less accounted for 9 percent of the 476 reported cases. The number of incidents involving childhood pesticide poisoning continues to decease (Table 24).

The 42 cases involved 37 different incidents. Thirty-one cases were non-agricultural, 11 occurred in agriculture and 23 exposures took place in the home. Insecticides were involved three times as frequently as other pesticides.

Nineteen (10 females and 9 males) of the 42 cases were determined to be definitely, probably, or possibly related to pesticides. Five children were under the age of six, four were ages 6-10, and 10 were ages 11-18. DOH classified the severity of the 19 cases as: 16 (84%) mild, two (10%) moderate and one severe. The severe case involved a child (18 months old) who ingested a pesticide. Drift accounted for the largest number of pesticide exposures (5) in this group.

- ***DOH # 980007*** *A child (18 months old) ingested 1-2 ounces of lindane shampoo. He was transported to the hospital and had a seizure shortly after arrival. He was lavaged, given activated charcoal and admitted for further observation. He remained stable and discharged the next day. Classification: definite, Severity: severe.*

Five of the 42 childhood cases occurred on the job, and three of these occurred in agriculture in one incident (described below).

- ***DOH # 980026*** *Four female workers became ill with nausea, vomiting, headache and dizziness after working with ornamental roses in a nursery. Three were eighteen years old. Spray records indicated that an application of insecticide soap had occurred 4 hours before symptoms started. Pesticide label had a restricted entry interval of 12 hours. L&I inspection followed. Classification: probable 3, possible 1, Severity: moderate 3, mild 1.*

### Incidents Involving Children from 1993 through 1998

Table 24 shows all reported cases involving children from 1993 through 1998. The decrease in 1995 reflects DOH and WPC policy not to investigate childhood asymptomatic rodenticide poisonings.

**Table 24 Pesticide Poisonings Involving Children 1993-1998**

| Year | Reported Cases | Cases* |
|---|---|---|
| 1998 | 42 | 19 |
| 1997 | 69 | 24 |
| 1996 | 61 | 28 |
| 1995 | 53 | 16 |
| 1994 | 230 | 16 |
| 1993 | 169 | 35 |

*Definite, Probable or Possible

**Table 25 Age Breakout for 1998 Investigated Childhood Cases**

| Age | Cases |
|---|---|
| Under 1 | 4 |
| 1 | 2 |
| 2 | 7 |
| 3 | 4 |
| 4 | 1 |
| 5 | 1 |
| 6-10 | 7 |
| 11-18 | 16 |
| **Total Childhood Investigated Cases** | **42** |

Table 25 lists the age of children involved in investigated pesticide cases. Forty percent of cases involved children less than four years old.

**DOH Observations**

The number of pesticide incidents reported to DOH in 1998 increased slightly from 1997 but less than in 1996 and 1995. The percent of cases classified as definite, probable and possible has remained between 43 and 49 for the past four years.

While the number of cases involving commercial buildings decreased in 1998 the number of cases involving pesticide drift increased. Drift complaints comprised thirty percent of all reported cases compared to 12 percent in 1997 and accounted for 40% of all definite, probable and possible cases. This re-enforces the need to continue educational efforts to increase applicator awareness of the risk of pesticide drift.

More cases classified as definite, probable or possible occurred while on the job and in agriculture. This seems to be consistent with the use of agricultural pesticides having higher percentages of active ingredient and increased worker exposure times in large application areas.

## Department of Labor and Industries (L&I)

L&I responds to concerns from workers exposed to pesticides through two divisions: the Washington Industrial Safety and Health Act (WISHA) Services Division, and the Insurance Services Division, Claims Administration Program. In 1998 L&I WISHA Services Division conducted 36 investigations involving pesticide handling and use complaints. The Insurance Services Division; Claims Administration Program received 269 claims relating to pesticide illness.

**WISHA Investigations**
WISHA Services Division staff address safety and health issues in the workplace. WISHA enforcement staff may issue citations that require employers to implement changes in the workplace, assign penalties to serious violations, and perform follow-up inspections to assure compliance.

In 1998, WISHA staff performed 36 pesticide related safety and health investigations in the workplace; 25 in eastern Washington and 11 in western Washington. These investigations occurred in both agricultural and nonagricultural environments. Nineteen involved orchards, six in other farms (berries, potatoes), four at other facilities (grain terminals, pest control activities, and road maintenance), four occurred in greenhouses or nurseries and three involved warehouses unloading shipping from overseas. Thirteen were employee or employee representative initiated complaints. Eleven investigations were the result of referrals from within the agency, or from other state agencies; 11 were planned inspections identified through the L&I targeting list and one was a fatality investigation (2 farm workers died from gun shot wounds in an orchard).

Violations were reported in 30 (18 had monetary penalties) of the 36 investigations. The following violations were most frequently cited: inadequate hazard communication program; inadequate respirator program or fit testing; inadequate eyewash facility; inadequate Personal Protective Equipment (PPE); no spray records; re-entry into treated area before the Restricted Entry Interval (REI) had expired; no accident prevention program; no material safety data sheets; lack of hazardous chemical labeling; no first aid training, kits, or cards; and inadequate record keeping.

**L&I Claims Insurance Services Division, Claims Administration Program**
The Insurance Services Division, Claims Administration Program, processes worker claims initiated by on-the-job injuries and illnesses including claims involving pesticides. In addition, these pesticide claims are referred to DOH for further investigation. In 1998, 269 claims were investigated by DOH because of possible health concerns. This compares with 235 investigated in 1997 and 222 in 1996.

In 1998, 203 (76%) claimants were exposed while working in agriculture and 66 (24%) in a non-agricultural setting. Sixty-six percent (134) of the claims, involved workers in the fruit industry and twenty two percent (45) in field crops. There was an increase in the number of agricultural pesticide claims reported in 1998 from prior years, 166 in 1997 and 165 in 1996.

**The following L&I claims and DOH investigation summaries illustrate the type of incident which occurs in the agricultural occupational environment:**

Table 26 lists claims by business type.

***L&I P738176 and DOH 980218*** *An orchard applicator developed eye irritation after he was sprayed accidentally by another applicator applying azinphos-methyl, and tri-fol at night. He was wearing PPE and goggles but the spray ran between his face and the goggles. He didn't wash his eyes for three minutes. He saw a clinician the next day. (Classification: definite, severity: mild.)*

***L&I X064842 and DOH 980080*** *An applicator spraying mancozeb, a fungicide on tulip bulbs developed dermatitis on both hands. He wore PPE but the gloves were over his sleeve and the spray ran down his sleeve and under his glove. L&I investigated and found violations. He was treated at the ER for bilateral contact dermatitis. (Classification: probable, severity: mild).*

***L&I P728982 and DOH 980278*** *Paraquat splashed into a ranch foreman's eye. The pesticide squirted through an air vent at the top of the tank when the tank mix was being transferred. He immediately used the eyewash and went to the ER. (Classification: definite, Severity: mild).*

**Table 26 1998 L&I Pesticide Related Claimants by Business Type***

| ***Agricultural*** | **1998** |
|---|---|
| Fruit | 134 |
| Field crops | 44 |
| Vegetables | 3 |
| Nursery/greenhouse | 16 |
| Berries | 2 |
| Christmas trees/Forest | |
| Other/Unknown | 4 |
| | 203 |
| ***Non Agricultural*** | |
| Applying/mixing | |
| Landscape/PCO | 8 |
| Maintenance/mgrs | 7 |
| Gardner/groundskeeper | 4 |
| Dairy worker | 2 |
| Painter | 2 |
| Other | 6 |
| Residue/Drift Exposure | |
| Office/clerical | 5 |
| Health care workers | 4 |
| Forklift drivers | 2 |
| Other | 5 |
| Accidental Release/Spills | |
| Thrift store | 13 |
| Retail sales | 2 |
| Other | 6 |
| **Total** | **66** |

* *Includes all claims referred to DOH that alleged pesticide exposure.*

**The following L&I claims and DOH investigation summaries illustrate the type of incident which occurs in the non agricultural occupational environment:**

***L&I Claim P765036 and DOH 980023*** *Thirteen thrift store workers were sent to the ER following exposure to a pesticide found mixed in with donated items. The bottle of 90% malathion concentrate broke in the sorting area. Four people received oxygen and all complained of headache and nausea. (Classification: 4 Definite, 9 Probable, Severity: 13 mild).*

***L&I Claim P818878 and DOH 980031*** *A chemical plant operator working with metam-sodium, a fumigant, developed skin irritation on his feet after his leather boots became saturated with the splashed chemical. He was wearing PPE except for his shoes. He was treated in an ER for chemical burns on both feet. (Classification: Definite, Severity: mild)*

***L&I P782916 and DOH 980203*** *An apartment manager noticed fleas while working in an apartment. He set off an insect fogger, came back four hours later opened the window and noticed residual fleas. He sprayed himself with DEET. Experienced stomach cramps and nausea*

*and went home. The next day upon re-entering the apartment the symptoms reoccurred. He went to the ER for treatment. Classification: Probable, Severity: mild.*
***L&I Claim: P997500 and DOH 980399*** *A hotel housekeeper was exposed to a flea bomb when a child removed the product from her housekeeping cart. The child activated the flea bomb and the woman inhaled the product while removing the can from the building. She was seen in the ER that evening for shortness of breath, dizziness and wheezing. (Classification: Probable, Severity: mild).*

In 1998, the majority of initial medical visits were paid, and the claims were determined (Table 27) in accordance with the following definitions:

**Table 27 Status of Claims Related to Pesticides**

| Claim Type | 1994 | | 1995 | | 1996 | | 1997 | | 1998 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Medical Only/ noncompensable | 138 | 57% | 134 | 55% | 97 | 44% | 108 | 46% | 155 | 58% |
| Time loss/ compensable | 12 | 5% | 9 | 4% | 8 | 4% | 14 | 6% | 11 | 4% |
| Rejected | 66 | 27% | 98 | 40% | 111 | 50% | 101 | 43% | 100 | 37% |
| Pending | 25 | 10% | 3 | 1% | 2 | 1% | 12 | 5% | 2 | 1% |
| Kept on salary | - | - | 1 | - | 1 | - | - | - | 1 | - |
| Unknown | - | - | - | - | 3 | 1% | - | - | - | - |
| **Total** | **241** | | **245** | | **222** | | **235** | | **269** | |

**Medical Only/Non-Compensable Claim:** A worker experienced symptoms that he/she believes occurred from exposure on-the-job and seeks medical evaluation. The physician finds the symptoms related to the exposure and there is objective evidence of injury. Therefore, the claim is allowed and medical evaluation and any follow-up medical care/treatment is paid. The employee misses less than three days of work. These lost workdays are not reimbursed to the employee.

**Time Loss/Compensable Claim:** A worker has an allowable claim and misses more than three days of work immediately following an exposure on the job. The worker is paid a portion of salary while unable to work. All related medical costs are covered.

**Rejected Claims:**
Initial diagnostic and evaluation medical costs are covered but the claim is rejected because objective evidence is lacking to relate the symptoms to the workplace exposure. Many claims are rejected because the symptoms have resolved by the time treatment is obtained; there is no objective evidence of injury; or, exposure cannot be confirmed or documented. A rejected status prevents the worker from re- opening a claim based on original symptoms. Initial medical visits are usually paid.

**Pending:** Additional information is being collected on the claim before a determination can be made.

**Kept On Salary:** The employer elects to pay the claimant's salary instead of L&I paying time loss payments while the employee is recovering from an injury or illness.

In 1998, L&I paid out a total of $138,317.39 for pesticide related claims.

**L&I Observations**

In 1998, L& I conducted a review of claims data since1994 to determine the reasons for an increase in rejected pesticide claims. (From 6% in 1993 to 50% in 1996) The dramatic increase in the rejection rate of pesticide claims occurred when "auto-ajud" (claims with certain ICD-9 codes were adjudicated by computer) was discontinued and the newly formed Chemically Related Illness (CRI) unit in the Industrial Insurance Division began individually reviewing claims. After reviewing a sample of rejected claims classified by DOH as definite, probable, possible or unrelated, L&I concluded that the "level of scrutiny applied to these claims was over zealous given that the majority involved no time loss; employers confirmed the exposure events for one-third of the claims; physical exam findings were minor; and, none resulted in any impairment." Since meeting with the CRI Unit and distribution of the studies findings L&I has observed a decrease in the rejection rate. Evaluation of the 1998 data of 269 pesticide-related claims indicates a rejection rate of 37%. Preliminary figures from 1999 show a 22% rejection rate for pesticide claims adjudicated.

In 1998, the number of pesticide related claims referred to DOH for investigation increased by 14 percent. This probably reflects refinements in L&I's system to identify and refer claims related to potential pesticide exposure.

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## Washington Poison Center

In 1998 the Washington Poison Center (WPC) received 134,605 calls. Of these, 3,002 were pesticide related calls and account for two percent of total calls received statewide by WPC (Table 28).

In Washington State pesticide poisonings are a reportable condition (WAC 246-100-217), and health care providers can report to DOH or through the WPC. All calls from health care providers are forwarded to DOH for investigation along with calls referred to a health care provider, or if a health care provider required case management assistance. In 1998, 138 referrals from WPC were investigated by DOH because of clinical signs and symptoms of pesticide illness. DOH classified these cases: 13 definite, 26 probable, 31 possible, 19 unlikely, 18 unrelated, 22 unknown, 8 asymptomatic (pesticide exposure was confirmed but the individual exhibited no symptoms) and 1 indirect. The majority of these cases had mild or no symptoms 105 (76%), had moderate symptoms 27 (20%), and had severe symptoms 6 (4%). As in previous years, the majority (94%) of pesticide related calls to WPC involved accidental exposure.

Insecticides continued to be the type of pesticide most frequently involved in calls to WPC (63%).

**Table 28 WPC Comparison with Prior Years**

| Pesticide | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|---|---|---|---|---|---|---|---|---|---|
| Fungicide | 86 | 141 | 124 | 117 | 96 | 104 | 120 | 88 | 72 |
| Herbicide | 650 | 608 | 637 | 573 | 512 | 531 | 441 | 482 | 485 |
| Insecticide | 3,633 | 3,090 | 3,460 | 3,158 | 2,040 | 2,173 | 1,992 | 2,103 | 1,886 |
| Moth | 180 | 187 | 158 | 120 | 68 | 89 | 66 | 77 | 65 |
| Rodenticide | 682 | 655 | 664 | 676 | 473 | 478 | 473 | 477 | 478 |
| **Total** | **5,231** | **4,681** | **5,043** | **4,644** | **3,189** | **3,375** | **3,092** | **3,227** | **3,002** |
| **% of Total Calls to WPC** | **4.1%** | **3.7%** | **3.9%** | **3.09%** | **2%** | **2%** | **2%** | **2%** | **2%** |

Forty-two percent (1,229) of the calls to WPC involved children less than six years of age. Table 29 illustrates WPC calls by pesticide type for the different age groups. This distribution is consistent with prior years.

**Table 29 1998 WPC Calls by Pesticide Type and Age**

| Pesticide Type | Less than 6 years old | 6-19 years old | >19 years old | Total Human Exposure Calls |
|---|---|---|---|---|
| Fungicides | 13 | 6 | 51 | **72** |
| Herbicides | 131 | 59 | 299 | **501** |
| Insecticides | 668 | 270 | 891 | **1886** |
| Moth Repellents | 36 | 6 | 21 | **65** |
| Rodenticides | 381 | 30 | 61 | **478** |
| **Total*** | **1229** | **371** | **1323** | **3002** |

* Age was not reported on 79 calls.

Table 30 lists the types of insecticides involved in calls to WPC, 1995 - 1998. Note that an incident may frequently involve more than one type of pesticide in the product.

**Table 30 1995 - 1998 WPC Type of Insecticide involved in Poisoning Call**

| Insecticides Generic Code/description | Number of Calls | | | |
|---|---|---|---|---|
| | 1995 | 1996 | 1997 | 1998 |
| Arsenic | 5 | 7 | 5 | 5 |
| Borates/Boric Acid | 38 | 27 | 32 | 32 |
| Carbamate Only | 104 | 61 | 91 | 64 |
| Carbamate with other pesticides | 51 | 24 | 15 | 8 |
| Chlorinated Hydrocarbon only | 125 | 125 | 130 | 104 |
| Chlorinated Hydrocarbon with other | 3 | 8 | 3 | 6 |
| Metaldehyde | 67 | 76 | 80 | 48 |
| Organophosphate only | 450 | 360 | 395 | 372 |
| Organophosphate with carbamate | 29 | 15 | 17 | 14 |
| Organophosphate with chlorinated hydrocarbons | 16 | 9 | 4 | 12 |
| Organophosphate with other pesticide | 46 | 44 | 32 | 35 |
| Organophosphate/carbamate/chlorinated hydrocarbons | 0 | 0 | 1 | 2 |
| Piperonyl butoxide only | 3 | 5 | 3 | 1 |
| Piperonyl butoxide/pyrethrins | 282 | 323 | 306 | 266 |
| Pyrethrins only | 249 | 253 | 267 | 262 |
| Repellants (insect) | 169 | 144 | 154 | 130 |
| Rotenone | 6 | 3 | 5 | 2 |
| Veterinary insecticide | 200 | 179 | 277 | 215 |
| Other | 112 | 128 | 89 | 92 |
| Unknown | 217 | 200 | 197 | 216 |
| **Total** | **2,173** | **1,992** | **2,103** | **1,886** |

Table 31 below provides additional information on the types of calls received by WPC. Approximately three percent of pesticide calls involve intentional exposures. Nineteen percent of all pesticide calls were managed in health care facilities, and two percent of these exposure calls reported a moderate or more severe illness (WPC definitions) from the event. The three deaths reported relating to pesticide exposure were reviewed by the WPC medical director and found to be mistakes in coding.

**Table 31 1998 WPC Calls by Pesticide, Type of Exposure and Severity**

| | Accidental | Intentional | Managed in Health Care Facility | Moderate Effect | Major Effect | Direct Death |
|---|---|---|---|---|---|---|
| Fungicide | 72 | 0 | 17 | 1 | 0 | 0 |
| Herbicide | 485 | 4 | 103 | 12 | 0 | 1* |
| Insecticide | 1755 | 51 | 338 | 38 | 1 | 1** |
| Moth Repellant | 54 | 4 | 10 | 0 | 0 | 0 |
| Rodenticide | 447 | 20 | 74 | 3 | 2 | 1*** |
| | 2,813 | 79 | 542 | 54 | 3 | 3 |

- *Herbicide "other" (wrong code)
- ** Insecticide Organophosphate with chlorinated hydrocarbon (wrong code)
- ***Rodenticide strychnine(wrong code)